

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

All claims currently being amended are shown with deleted text struckthrough or double bracketed and new text underlined. Additionally, the status of each claim is indicated in parenthetical expression following the claim number.

Please amend claims 2-10, 16, 19-23, 26 and 28.

CLAIMS:

1. (Original) An *in situ* desalination apparatus adapted in use to be used located in a borehole containing groundwater from a subterranean aquifer, the desalination apparatus comprising:

a sealing means for separating the borehole into upper and lower portions;

a reverse osmosis unit comprising a reverse osmosis medium;

an inlet for the reverse osmosis unit located on one side of the reverse osmosis medium, in use the inlet to be located below the upper surface of the groundwater and in the upper portion of the borehole with respect to the sealing means;

a concentrate outlet for the reverse osmosis unit opening to the same side of said reverse osmosis medium as the inlet, for delivering concentrate to the lower portion of the borehole with respect to the sealing means;

a permeate outlet on the other side of the reverse osmosis medium from said inlet;

a delivery line in fluid communication with the permeate outlet in use extending from the body of water; and

a pump for delivering groundwater to the inlet.

2. (Currently Amended) [[A]] An *in situ* desalination apparatus according to claim [[2]] 1 wherein the sealing means is adapted to allow the apparatus to be removably inserted into a borehole casing.

3. (Currently Amended) [[A]] An *in situ* desalination apparatus according to claim [[2]] 2 wherein the sealing means is expandable from a state receivable within the casing to an expanded state sealed against the casing.

4. (Currently Amended) [[A]] An *in situ* desalination apparatus according to claim 2 or claim 3 wherein the sealing means comprises an inflatable packer which can be selectively inflated to seal against the casing.
5. (Currently Amended) [[A]] An *in situ* desalination apparatus according to any one of claims 2 to 4 wherein the claim 1 comprising a casing for the borehole, the casing comprising comprises a wall at least a portion of which is screened allowing water to flow therethrough.
6. (Currently Amended) [[A]] An *in situ* desalination apparatus according to claim 5 wherein the sealing means seals against the casing to separate the borehole into an upper part wherein the casing comprises a screened wall portion for admitting water from the aquifer and a lower part wherein the casing comprises a screened wall portion to allow the saline concentrate to dissipate within the aquifer.
7. (Currently Amended) [[A]] An *in situ* desalination apparatus according to claim 6 wherein the casing comprises two screened portions axially spaced along the length of the casing.
8. (Currently Amended) An *in situ* desalination apparatus as claimed in any one of the previous claims according to claim 1 wherein the permeate outlet is associated with a pumping means adapted to extract permeate passing through the reverse osmosis medium.
9. (Currently Amended) An *in situ* desalination apparatus as claimed in any one of the previous claims according to claim 1 wherein the permeate outlet is vented to the atmosphere.
10. (Currently Amended) An *in situ* desalination apparatus as claimed in any one of the previous claims according to claim 1 wherein the pump is a common pump connected to the inlet and the permeate outlet through a set of valves whereby said common pump is able to introduce said water into the inlet and deliver permeate from the permeate outlet through a controlled activation of the valves.
11. (Original) An *in situ* desalination apparatus comprising a length of tubular borehole casing adapted in use to be located in a borehole the casing comprising at least a portion of screened wall for allowing the passage of water through the casing; a sealing means for sealing against the borehole casing and dividing the borehole within the casing into an upper portion and a lower portion, the sealing means and borehole

casing cooperating to allow flow of ground water through a screened portion into at least the upper portion;

a reverse osmosis unit supported within the bore hole by the sealing means the reverse osmosis unit having a reverse osmosis medium;

an inlet for the reverse osmosis unit providing communication between the upper portion of the interior of the casing and one side of the reverse osmosis medium;

a concentrate outlet for the reverse osmosis unit providing communication between the one side of the reverse osmosis medium and the lower portion of the borehole;

a permeate outlet for the reverse osmosis unit opening on the other side of the reverse osmosis medium;

a delivery line in communication with the fluid outlet line extending from the body of water; and

a pump for delivering water under pressure from the upper portion of the interior of the casing to the inlet, whereby the pressure differential created across the reverse osmosis medium facilitates reverse osmosis.

12. (Original) An *in situ* desalination apparatus according to claim 11 wherein the tubular borehole casing includes a portion of screened wall in the upper portion of the casing with respect to the sealing means and a screened portion in the lower part with respect to the sealing means.

13. (Original) An *in situ* desalination apparatus according to claim 11 wherein the screened wall is continuous.

14. (Original) An *in situ* desalination apparatus according to claim 11 wherein there are at least two portions of screened wall at axially spaced locations along the length of the casing.

15. (Original) An *in situ* desalination apparatus according to claim 11 further comprising a groundwater delivery pump for providing a flow of groundwater through a screened portion into an upper portion of the borehole in the casing.

16. (Currently Amended) [[A]] An *in situ* desalination apparatus according to claim 11 wherein the sealing means is expandable from a state receivable within the casing to an expanded state sealed against of the casing.

17. (Original) An *in situ* desalination apparatus as claimed at claim 11 wherein the permeate outlet is associated with a pumping means adapted to extract permeate passing through the reverse osmosis medium.

18. (Original) An *in situ* desalination apparatus as claimed at claim 17 wherein the permeate outlet is vented to the atmosphere.

19. (Currently Amended) An *in situ* desalination apparatus ~~as claimed in any one of claims 11 to 18 according to claim 11~~ wherein the concentrate outlet is controlled to maintain pressure of predetermined magnitude sufficient for reverse osmosis.

20. (Currently Amended) An *in situ* desalination apparatus ~~as claimed in any one of claims 11 to 19 according to claim 11~~ wherein the sealing means comprises an inflatable packer which can be selectively inflated to provide the sealing against the casing.

21. (Currently Amended) An *in situ* desalination apparatus ~~as claimed in any one of claims 11 to 20 according to claim 11~~ wherein the concentrate outlet is controlled by an exhaust valve which is closed upon the pressure at the one side of the reverse osmosis medium falling below a pressure of determined magnitude which is at least equal to the desired operating pressure of the reverse osmosis unit.

22. (Currently Amended) An *in situ* desalination apparatus ~~as claimed at any one of the previous claims according to claim 11~~ wherein the reverse osmosis medium, pump and sealing means together comprise a unit which is removable from the casing.

23. (Currently Amended) An *in situ* desalination apparatus ~~as claimed at claims 11 to 22 according to claim 11~~ wherein the screened portion casing comprises two screened portions at axially spaced locations along the length of the casing and the sealing means in use engages the inner face of the casing between the two screened portions such that the upper portion communicates with the upper most screen and is sealed from the lower screen.

24. (Original) An *in situ* desalination apparatus according to claim 11 comprising a borehole in an aquifer comprising a water table, a borehole casing lining the borehole, an assembly comprising the reverse osmosis unit, the pump and the sealing means adapted to be removably inserted in the borehole casing and retained therein by radial expansion of the sealing means;

25. (Currently Amended) A method of desalination of groundwater in an aquifer disposed below a ground surface comprising:
providing a borehole in the ground surface extending into the aquifer;

providing a reverse osmosis unit according to ~~any one of claims 11 to 24~~ claim 11 and locating the reverse osmosis unit in a borehole such at (a) sealing means separates water within the borehole casing into upper and lower portions; (b) the inlet is located below the upper surface of the body of groundwater and in the upper portion with respect to the sealing means; and (c) the concentrate outlet for the reverse osmosis unit opens to the lower portion of the borehole with respect to the sealing means;

pumping ground water from the upper portion of the borehole;

providing a permeate outlet for delivering permeate to the ground surface;

collecting permeate at the ground surface; and

delivering concentrate to the concentrate outlet in the lower portion of the borehole so that the concentrate descends through the aquifer.

26. (Original) A method according to claim 25 wherein the concentrate is retained below the water surface and is allowed to descend through the aquifer from the concentrate outlet.

27. (Original) A method according to claim 26 wherein the desalination is conducted under ambient conditions within the borehole.

28. (Currently Amended) A method according to claim [[28]] 27 wherein the concentrate is isolated from sunlight and air from the surface.